

103201

232017

103.3.3.1 Chronic Toxicity

Data Review Number: ES W1

Test: Avian Reproduction Wild Waterfowl

Species: Mallard Duck (Anas platyrhynchos)

Results: Technical Muscamone was fed to mature mallard ducks at dietary concentrations of 2 ppm and 20 ppm throughout a One-Generation Reproduction Study.

Based on the data presented in this report, an environmental concentration of 2 ppm of technical Muscamone represents a reproductive hazard to mallard ducks.

Chemical: Technical Muscamone

Title: One-Generation Reproduction Study - Mallard Duck Technical Muscamone Final Report

Accession No.: 232017

Study Date: April 10, 1974

Researcher: Truslow Farms, Inc.

Registrant: Thuron Industries, Inc.

Validation Category: Supplemental

Category Repairability: Yes. In a letter dated November 13, 1974, Thuron Industries, Inc. chose to rebut the results of this study claiming poor statistical analysis for the displayance of statistical differences between treated birds and controls. The registrant claimed access to the raw data (i.e., eggs laid/pen/day/set/week) and this was analyzed. This section has not been provided with this analysis for review. The registrant should submit to this section all raw data for analysis before this section can make an adequate evaluation of the possibility of Muscamone at some residue level in the environment causing reproductive impairment in waterfowl. The registrant did conduct another avian waterfowl reproduction study at lower residue levels to identify hazard at the proposed use rates.



ADDITIONAL INFORMATION:

Reproductive Data - Mallard Ducks	Controls	Technical Muscamone (ppm)	
		2	20
✓ Eggs Laid	744	636	616
Eggs Cracked	6	14	10
Eggs Set	673	583 <sup>583</sup>	565 <sup>575</sup>
✓ Viable Embryos	579	453	365*
✓ Live Three-Week Embryos	570	423	365*
✓ Normal Hatchlings	388	203*	183*
Fourteen-Day-Old Survivors	380	193**	168**

Eggs Set excludes those cracked and those removed for eggshell thickness analysis.

\* The above differences were approaching statistical significance ( $p < 0.1$ ).

\*\* The above differences were statistically significant ( $p < 0.05$ ).

	Expected Values	Controls	Technical Muscamone (ppm)	
			2	20
Eggs Laid Per Hen				
In Eight Weeks	28 - 38	29.8	25.4	24.6
Eggs Cracked Of Eggs				
Laid (%)	0.6 - 6%	0.8	2.2	1.6
Viable Embryos of				
Eggs Set (%)	85 - 98%	86	78	65+
Live Three-Week				
Embryos Of				
Viable Eggs (%)	97 - 99%	98	93	98
Normal Hatchlings of				
Live Three-Week				
Embryos (%)	50 - 90%	68	48**	51**
Fourteen-Day				
Survivors Of				
Normal				
Hatchlings (%)	94 - 99%	98	95+	92+
Fourteen-Day				
Survivors Per				
Hen	11 - 14	15.2	7.7**	6.7**

\*\* The above differences were statistically significant ( $p < 0.05$ ).

+ The above differences were statistically significant ( $p < 0.01$ ).

Eggshell Thickness - Mallard Ducks	Controls	Technical Muscamone (ppm)	
		2	20
Number of Eggs Analyzed	<sup>61</sup> 48	48 <sup>31</sup>	<sup>41</sup> 48
Mean Shell Thickness (mm)	0.352	0.338	0.344

The above differences were not statistically significant ( $p < 0.05$ ).

Egg laid Mallard  
Z-9-Tricosene  
NOT Sign - Wild  
Int

143.  
151.  
174. Control  
128.  
146.

148.8  
221.36

74.  
170.  
109. 2.0 ppm  
137.  
146.

127.2  
1088.56

90.  
86.  
150. 20.0 ppm  
167.  
123.

123.2  
1024.56

.9748809157 < 3.87  
2.  
12.

11672.4  
1896.53333  
13568.93333

Mallard  
Z-9-Tricosene  
NOT Sign  
Wildlife Int

Egg Set

129.  
139.  
160.  
113.  
132.

134.6  
233.84

65.  
157.  
97.  
127.  
137.

116.6  
1040.64

83.  
74.  
141.  
154.  
113.

113.  
977.2

.7137070987 < 3.87  
2.  
12.

11258.4  
1339.2  
12597.6

Mallard  
Viable Embryos  
Z-9-Tricosene  
Sign at 90%  
Wildlife Int 90%

113.  
122. control  
136.  
92.  
116.

115.8  
204.16

37.  
133.  
91. 2.0 ppm  
97.  
95.

90.6  
946.24

74.  
53.  
59. 20.0 ppm  
120.  
59.

73.  
600.4

3.1718528E7 > 2.61  
2.  
12. ?(2.1)

8754. ESS  
4627.73333  
13381.73333

Live Three Week  
Embryos  
Mallard  
Z-9-Tricosene  
Sign at P=0.05  
Wildlife Int

110.  
121.  
135.  
91.  
115. control

114.4  
207.04

37.  
110.  
91.  
92.  
93. 2.ppm

84.6  
615.44

74.  
51.  
52.  
120.  
55. 20 ppm

71.2  
662.56

3.950129255 > 3.67  
2.  
12.

7427.2  
4889.793333  
12316.93333

Reproductive Data  
Z 19-Tricosene - Mallard  
Normal Hatchlings  
Sign at (P=0.05)  
Wildlife  
Int.

83.  
81. Control  
91.  
62.  
71.

77.6  
101.44

16.  
69.  
27. 2.ppm  
37.  
54.

40.6  
357.84

34.  
30.  
31. 20.0 ppm  
64.  
24.

36.6  
198.24

9.325952062 > 3.87  
2.  
12.

3287.6 ESS  
5110. TSS  
8397.6 TSS

Mallard  
Z-9 Tricosene

14 day survivors  
Wildlife Int  
Sign at 0.01 P

81.  
70.  
58. control  
58.  
37.  
30.  
31.  
15.

47.5  
449.25

15.  
27.  
23. 2.ppm  
36.  
40.  
23.  
15.  
7.

24.125  
128.859375

3.  
15.  
15.  
34. 20.ppm  
50.  
24.  
15.  
12.

Mallard  
 Shell Thickness  
 Z-9 Tricosene  
 wildlife Int.  
 NOT Sign

0.349  
 0.348  
 0.348  
 0.344  
 0.353 control

0.3464  
 0.00004184

0.342  
 0.344  
 0.334 2.0 ppm  
 0.32  
 0.351

0.3382  
 0.00011216

0.346  
 0.344  
 0.346 20 ppm  
 0.342  
 0.34

0.3436  
 0.00000544

1.307576523 < 3.87  
 2.  
 12.

0.0007972

Mallard  
~~Variable Embryo~~  
 Z-9 Tricosene  
 NOT Sign  
 wildlife Int  
 Eggs cracked

1.  
 C.  
 1.  
 2.  
 2. control

1.2  
 0.56

2.  
 3.  
 4.  
 2. 20 ppm  
 1.

2.8  
 2.16

C.  
 C.  
 C.  
 2. 20 ppm  
 2.

2.  
 3.6

1.215189873 < 3.87  
 2.  
 12.

31.6  
 6.4  
 38.

Mallard  
~~Variable Embryo~~  
 Z-9 Tricosen  
 NOT Sign  
 Wildlife Int  
 Egg crushed

1.  
 C.  
 1.  
 M.  
 E.  
 Control

1.2  
 0.56

3.  
 4.  
 E.  
 1.  
 2.0 ppm

2.8  
 2.16

C.  
 C.  
 C.  
 E.  
 2.0 ppm

2.  
 3.6

1.215189873 < 3.87

2.  
 12.

31.6  
 6.4  
 38.

Mallard  
 Skull Thickness  
 Z-9 Tricosen  
 Wildlife Int.  
 NOT Sign

0.349  
 0.348  
 0.348  
 0.334  
 0.353  
 Control

0.3464  
 0.00004164

0.342  
 0.344  
 0.334  
 0.32  
 0.351  
 2.0 ppm

0.3362  
 0.00011216

0.346  
 0.344  
 0.346  
 0.342  
 0.34  
 2.0 ppm

0.3456  
 0.00000544

1.307576523 < 3.87  
 E.  
 12.

0.0007972